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ENVIRONMENTAL AWARENESS OF SENIOR HIGH SCHOOL STUDENTS ON THE WATER FOOTPRINT OF ARTIFICIAL INTELLIGENCE

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ABSTRACT

The growing adoption of artificial intelligence (AI) in education has highlighted environmental issues, especially surrounding the water needed to maintain AI infrastructure. This study investigated the environmental awareness of senior high school students about the water footprint of artificial intelligence and its link with their profiles and extent of use of AI. The study utilized descriptive-correlational research design using 144 Grade 11 and Grade 12 students of General Luna National High School, Nueva Ecija, Philippines. Data were acquired using structured survey questionnaire and analyzed using frequency, percentage, weighted mean and correlation analysis. The results showed that all the respondents had used generative AI and that ChatGPT was the most often used application, mostly for understanding courses, doing assignments, and preparing for exams. Students described use of AI in terms of functionality sometimes, but often in terms of availability and complexity-related activities. In general, the environmental awareness was good, with better environmental concern, responsibility and motivation than thorough comprehension of AI-related environmental challenges. Age was positively and significantly associated with complete comprehension, environmental concern and responsibility while frequency of AI use was not significantly associated with any of the dimensions of environmental awareness. Moreover, AI practices on availability and complexity were strongly positively correlated with all elements of environmental awareness. Thus, more use of generative AI is not necessarily associated with better knowledge of its environmental impacts. The study emphasizes the necessity of AI-related environmental literacy in secondary education, especially through learning activities that enhance students' understanding of the water footprint of AI and motivate the use of technology in an educated and ecologically responsible manner.

KEYWORDS: *Artificial intelligence, environmental awareness, generative AI, senior high school students, water footprint*

INTRODUCTION

Artificial intelligence (AI) is the attempt to mimic the human brain's thought processes to enable computer systems to do or complete tasks that are normally associated with human intellect. One of its more accessible applications is generative AI, which generates text, pictures and other digital content based on human prompts. How learners get knowledge, analyze complex ideas, satisfy academic requirements and conduct research are among the educational processes that AI-based platforms have changed today. In Junior and Senior High School levels, with the use or assistance of AI, learners can get instant explanations of complicated concepts, writing help, and other academic support.

But despite the potential and efficiency AI can offer, unfortunately it needs physical infrastructure, and with that it will take huge amounts of electricity and water to operate. Generative artificial intelligence systems depend on data centers full of powerful computers that generate heat as they process information. Some cooling systems need water to keep these servers from overheating, but significantly more water is needed for energy generation and the manufacturing of semiconductor components. According to Environmental and Energy Study Institute (2025), the water footprint of data centers is primarily driven by three sources: on-site cooling, energy production, and hardware manufacturing. The institute also noted that large data centers can consume as much as five million gallons of water a day, but actual use varies on the facility's size, location and cooling system. An estimate from Agence France-Presse (2025) suggested that it might take around half a liter of water to produce 10 to 50 replies with GPT-3, depending on the working conditions. More recently, United Nations News (2026) anticipated that by 2030 AI-related water usage might equal the basic annual domestic water needs of approximately 1.3 billion people. The results reveal that the environmental implications of AI are not just power consumption and carbon emissions, but also increased pressure on freshwater supplies.

This increased consumption of water by AI is an environmental problem, especially when students use digital gadgets in their daily academic tasks. When you get an answer from an AI it feels like an electronic conversation. But the computations that go into this require resources that are not apparent to the users or learners. Students may therefore know about AI as a useful instructional instrument, but not about the water it uses. However, learners are not aware of the environmental consequences of generative AI as explored in the study of Dungo et al. (2025). Likewise, more than half of the respondents in Gibbons et al. (2025) were surprised to learn about AI-related water use, showing they have minimal exposure to this environmental issue. The studies have shown knowledge inequalities among university students but the reviewed literature has not definitely shown the amount of such

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discrepancies among senior high school pupils. This distinction is essential because learners at the secondary level may be employing AI for academic reasons without the water resources understanding needed to enable such technology. Hence, it is necessary to assess their level of comprehension before discussing any instructional initiatives to promote environmentally responsible AI use.

The increased access to digital learning resources provides a relevant background for exploring the comprehension of students on AI and its environmental implications in General Luna National High School, namely in the Senior High School Department. AI-powered applications can be utilized for academic purposes such as searching for information, writing outputs, clarifying lessons and completing research-related duties. However, knowledge of these applications does not imply knowledge of the physical resources used in their operation. An essential concern from the researchers' point of view in the local school context is whether senior high school pupils correlate the use of AI with water use, especially the water for data center cooling, energy generation and hardware production. The water footprint of AI is indirect and less obvious in learners' daily experiences compared to other forms of water use such as household use and school sanitation. This circumstance calls for a school-based inquiry to ascertain whether learners are aware of such a relationship, rather than presuming that frequent exposure to AI is accompanied by appropriate environmental awareness.

Considering these, the present study aims to find out the level of awareness of the senior high school students of General Luna National High School about the water consumption of artificial intelligence. While some studies have touched on the environmental implications of generative AI among college students (Dungo et al., 2025) and explored awareness of generative AI's water footprint in higher education contexts (Gibbons et al., 2025), the existing evidence is insufficient to characterize the perceptions of learners in the local senior high school context regarding this specific environmental issue. This gap is contextual and demographic related. The study fills this gap by exploring students' awareness of the water resources required to support the AI activities including data center cooling, electricity generation, and hardware manufacture. The learners' present level of awareness can be established, to provide empirical evidence for boosting environmental education and fostering more informed use of AI-powered devices in secondary schools. The study highlights the need to ensure that technical innovation in education is supported by an understanding of its consequences for the sustainable management of freshwater resources.

Objectives of the Study

This study aims to describe the environmental awareness of Senior High School (SHS) Students on the water footprint of artificial intelligence.

Specifically, it aims to meet the following objectives:

1. To describe the profile of Senior High School students in terms of:
   1.1 age;
   1.2 sex;
   1.3 frequency of AI use;
   1.4 kind of generative AI use;
   1.5 purpose of AI use.
2. To describe the extent of AI usage of Senior High School students in terms of:
   2.1 functionality;
   2.2 availability; and
   2.3 complexity.
3. To describe the environmental awareness of Senior High School students on the water footprint of artificial intelligence in terms of:
   3.1 Comprehensive understanding of environmental problems;
   3.2 Active concern for the environment;
   3.3 Sense of environmental responsibility; and
   3.4 Motivation to protect the environment.
4. To determine the significant relationship between the profile of Senior High School students and their extent of AI usage.
5. To determine the significant relationship between the profile of Senior High School students and their environmental awareness on the water footprint of artificial intelligence.
6. To determine the significant relationship between the extent of AI usage of Senior High School students and their environmental awareness on the water footprint of artificial intelligence.

LITERATURE REVIEW

Artificial Intelligence in Education

In the article published by Wang et al. (2024) it was reported that there was a number of applications that could impact the delivery and management of educational services. The applications were classified as adaptive learning and personalized tutoring, intelligent evaluation and management, learner profiling and prediction, and creative educational products. These applications demonstrated the applicability of AI to various elements of teaching such as satisfying the needs of individual students and giving information for educational decision making. Likewise, Boncillo (2025) noticed that the incorporation of AI in educational procedures led to personalized teaching, automated grading, and data-driven instruction. The review also highlighted its usefulness to teachers' professional development, particularly in strengthening their competency in the use of technology for teaching and learning activities. The findings suggest that AI's educational relevance extends beyond the production of academic content, but may be applied to the organization, delivery and assessment of learning experiences.

The introduction of artificial intelligence in education has also changed the perception of their duties on the part of instructors and other stakeholders in the learning process. Gocen and Aydemir (2020) conducted a qualitative study with participants from education, law, and technology-related professions and found that, in general, assessments of AI's ability to improve educational services were positive. However, participants were also somewhat interested in the potential for less human connection, the changing role of teachers and the moral implications of more computerized educational procedures. This is also supported by the National Education Association's report (2024) noting that AI apps should not replace the link between teachers and learners. Instead it will

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function solely as support. The research stressed the value of human judgment, equitable access, privacy of education data and AI literacy for students and instructors. Taken together, these publications imply that successful AI integration is not just a question of the technological tools at hand, but also of educational institutions' consideration of the consequences of these applications for instructional relationships, professional responsibilities, and learners' ability to make informed decisions.

Co (2025) in a narrative study of Philippine educational research observed that higher education institutions, particularly private universities located in metropolitan regions, exhibited a higher degree of AI integration compared to basic education schools. The same analysis also revealed a gap or divergence in stakeholder attitudes, with students being more open and hopeful about AI than their teachers. However, in the absence of adequate technology infrastructure it can lead to limited professional advancement opportunities, lack of technical skills and lack of entire institutional frameworks all posed considerable challenges to adoption. These outcomes were noticed and reported in the study of Rodrigo and Talandron-Felipe (2024) wherein participating teachers from Public Schools had inadequate understanding and expertise with AI because of lack of appropriate technology resources .

Similarly, these findings are in line or with concurrence with literature explaining the complex and interrelated nature of integrating AI in education, involving instructional efficacy, stakeholder readiness, institutional support, and ethical use of technology. For an instance, there are also reported many approaches of applying artificial intelligence in education were described by Wang et al. (2024) and Boncillo (2025), while the need for human-centered and ethics-guided implementation was stressed by Gocen and Aydemir (2020) and National Education Association (2024). While, Co (2025) and Rodrigo and Talandron-Felipe (2024) argued that the implementation of AI in Philippine educational institutions varies based on the disparities in technological resources and users' readiness.

Artificial Intelligence and Water Footprint

Nowadays, the relationship between artificial intelligence and water consumption has been increasingly studied through the wider environmental requirements of computing infrastructure. Several studies were conducted, one of which was the study of Xiao et al. (2025) about the possible effect of AI in the environment, particularly in the United States' servers it showed that the use of AI infrastructure might significantly increase water demand along with energy consumption and carbon emissions. They also found that the indirect consumption of water from electricity generating was a larger portion of the operational water footprint than direct cooling. They also found that the environmental impact of deploying AI servers depend on where they are, the electricity infrastructure there and advancements in the efficiency of the technology. Zewe (2025) also stated in a report published by the Massachusetts Institute of Technology that the environmental demands of generative AI were more extensive than the initial development of computer models as their implementation, repeated usage, and subsequent fine-tuning needed additional resources. These papers show that the water footprint assessment of AI should take into account the ongoing operations and supporting infrastructure, instead of studying particular technological activity in isolation.

Water withdrawal is also tackled in some studies, it is describes as the amount of water withdrawn from a water source and water consumption is the part of water withdrawal that is not returned to the same watershed in a useable state or within a relevant period (Asinas et al., 2026). This is especially relevant when analyzing the environmental impacts of data centers because water-efficient operations do not ensure minimum demand on adjacent water supplies. The authors also point out that water impacts are tied to time of use, local hydrological conditions and competition amongst different water users. Similarly, Xiao et al. (2025) found that the locale of various AI servers together with the features of the regional energy systems affected the estimated water footprints.

Moreover, the growing environmental impact of AI has raised worries around the long-term sustainability of technological growth. The United Nations News stated in 2026 that research from the United Nations University show that "improvements in computational efficiency do not necessarily translate into reductions in overall resource consumption." "Wider use of AI applications may emerge from increased accessibility and lower operational costs, which will place further demands on the infrastructure that supports these technologies," the paper added. This concern is consistent with the findings of Asinas et al. (2026), who reported that the increased number of applications, iterative search process, and ongoing expansion of data centers may negate the efficiency improvements in AI.

Recent papers have discussed similar challenges, emphasizing the necessity of incorporating water conservation in the creation and regulation of artificial intelligence . In the study of Xiao et al. (2025) it was suggested potential improvements to the combined environmental implications of AI operations including higher data center efficiency, server utilization, generation of electricity and infrastructure location. Asinas et al. (2026) also suggested the adoption of efficient cooling technologies, other water sources, transparent reporting methods, and planning techniques that incorporate local watershed conditions . Similarly, the United Nations News (2026) stressed that the responsible development of AI will require attention to the environmental impacts throughout the life cycle of the technology, including the decisions made by the technology providers, governments, and users. Together, these articles show that AI-related water use is not just a technical challenge but also a question of sustainable resource management and ethical technology use. The literature evaluated contains a comprehensive discussion of infrastructure requirements, environmental consequences and mitigation methods, but limited direct evidence of how senior high school pupils grasp these concerns. This gives appropriate basis to explore students' understanding of water footprint in relation to their use of artificial intelligence (AI) technologies.

METHODOLOGY

The study will use a descriptive-correlational research methodology with a survey questionnaire to assess the environmental consciousness of Senior High School students

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on the water footprint of artificial intelligence. The descriptive method will be utilized to characterize the profiles of the respondents, the extent of their AI usage and their environmental awareness level, while the correlational method will be employed to determine the important relationships between these variables without manipulation.

The respondents will be 144 students from Grade 11 and Grade 12 of the Senior High School Department of General Luna National High School, Nueva Ecija. Data will be collected using a structured questionnaire divided into three parts; respondents' profiles; extent of AI use in terms of functionality, availability and complexity; and environmental awareness in terms of overall understanding of environmental problems, active concern for the environment, sense of environmental responsibility and motivation to protect the environment. Frequency will be measured by a five-point scale of AI use. Environmental awareness will be measured by a four-point scale of agreement.

Data collected will be examined using frequency, percentage, weighted mean, standard deviation and proper inferential statistics. Frequency and percentage will be used to describe the respondents' characteristics. Weighted mean and standard deviation will be used to establish their extent of AI usage and environmental awareness. Spearman's rank-order correlation and relevant statistical tests for categorical variables will be used to determine the significant associations between the profile of respondents, extent of AI usage and environmental awareness at the 0.05 level of significance. Tables 1 and 2 provide the rating scales utilized in the study.

Table 1

Rating Scale for the Extent of Artificial Intelligence Usage

Rating	Verbal Description	Verbal Interpretation
5	Always (A)	I did this whenever a relevant need arose.
4	Often (O)	I did this on most relevant occasions.
3	Sometimes (S)	I did this on some relevant occasions.
2	Rarely (R)	I did this on only a few relevant occasions.
1	Never (N)	I did not do this during the past 30 days.

Table 2

Rating Scale for Environmental Awareness of the Water Footprint of Artificial Intelligence

Rating	Verbal Description	Verbal Interpretation
4	Strongly Agree (SA)	The statement closely reflects what I know, think, or feel.
3	Agree (A)	The statement generally reflects what I know, think, or feel.
2	Disagree (D)	The statement generally does not reflect what I know, think, or feel.
1	Strongly Disagree (SD)	The statement does not reflect what I know, think, or feel.

RESULTS

Profile of the Respondents

Tables 3 and 4 provide the demographic characteristics and AI related profiles of the respondents. The data showed the distribution of the 144 senior high school students by their age, sex, frequency of generative AI use, AI applications used, and goals of use.

Table 3

Distribution of Respondents According to Age, Sex, and Frequency of Generative AI Use

Profile	Frequency	Percentage (%)
Age		
15 years old	7	4.9
16 years old	79	54.9
17 years old	55	38.2
18 years old	2	1.4
19 years old	1	0.7
Sex		
Male	51	35.4
Female	93	64.6
Frequency of AI Use		
Never	0	0.0
Less than once a week	15	10.4
About once a week	40	27.8
Several times a week	41	28.5
About once a day	27	18.8
Several times a day	21	14.6

Table 3 reveals that most of the respondents were aged 16 years (54.9%) followed by 17 years (38.2%). A tiny percentage was in the other age groups. Majority of the responders were female students (64.6%) while male students constituted 35.4%. The finding implies that most of the

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respondents were within the normal age bracket of senior high school learners and that there were more female students.

The biggest proportion of respondents reported utilizing generative AI several times a week (28.5%), with about once a week (27.8%) a close second. In addition, 18.8% said they used AI around once a day and 14.6% used it multiple times a day. Interestingly, no responder claimed they never employed generative AI. This finding confirms that all students in the study had exposure with generative AI, but the stated frequency of use differed. Therefore, the study assessed environmental awareness of learners with real exposure to AI apps, not a mixture of users and nonusers.

Table 4
Distribution of Respondents According to Generative AI Tools Used and Purposes of Use

AI Tools and Purposes	Frequency	Rank
Generative AI Tools Used		
ChatGPT	137	1
Other generative AI tools	23	2
Google Gemini	20	3
Claude	5	4
Perplexity AI	1	5.5
AI image generators	1	5.5
Microsoft Copilot	0	6.5
Never used generative AI	0	6.5
Purposes of AI Use		
Understanding lessons or unfamiliar topics	123	1
Answering assignments or school tasks	113	2.5
Reviewing or preparing for tests	113	2.5
Writing, revising, or summarizing text	86	4
Personal questions, hobbies, or entertainment	53	5
Creating images or other content	48	6
Other purposes	0	7.5
Never used generative AI	0	7.5

It can be observed from Table 4 that ChatGPT was the most used generative AI application, with 137 responses. Generative AI tools, the other ones, came in second, followed by Google Gemini. Few respondents selected Claude, Perplexity AI and AI image generators and Microsoft Copilot was not selected. The distribution shows that the respondents' expertise with generative AI was concentrated mainly on ChatGPT rather than evenly spread among the available applications. Among the 123 respondents, the response with highest weighted mean was to learn concepts or topics that were not known. Help with answering assignments and preparing for exams followed, each reported by 113 respondents. Common goals included writing, rewriting and summarizing texts, but fewer replies were given for personal amusement and content development. The results reveal that the respondents mostly employed generative AI as an academic assistance tool, especially in comprehending instructional content and fulfilling learning criteria. The findings also provide an important framework to study environmental awareness, as the students' experiences with AI were strongly related to their school-related activities.

Extent of Artificial Intelligence Usage

The extent of generative AI usage was examined through functionality, availability, and complexity-related practices. Table 5 presents the weighted means and verbal interpretations of the statements under each dimension.

Table 5. Extent of Artificial Intelligence Usage Among Senior High School Students

Indicators	Weighted Mean	Interpretation
Functionality		
Completing school tasks efficiently	3.10	Sometimes
Generating ideas before assignments	3.12	Sometimes
Reviewing and improving drafts	2.63	Sometimes
Addressing difficult parts of school tasks	3.49	Often
Obtaining suggestions to finish tasks quickly	3.38	Sometimes
Overall Mean	**3.14**	**Sometimes**
Availability		
Accessing AI when assistance is needed	3.26	Sometimes
Accessing AI through available devices	4.36	Always
Using AI outside class hours	3.27	Sometimes
Using AI for different kinds of tasks	3.60	Often

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Exploring topics beyond current lessons	3.48	Often
Overall Mean	**3.54**	**Often**
Complexity-Related Practices		
Seeking instructions for unfamiliar AI features	2.83	Sometimes
Revising prompts when responses are inadequate	4.29	Always
Requesting simpler explanations	3.65	Often
Asking follow-up questions	3.70	Often
Solving difficult tasks step by step	3.63	Often
Overall Mean	**3.54**	**Often**

Note. Interpretations follow the five-point rating scale: 4.21–5.00 = Always; 3.41–4.20 = Often; 2.61–3.40 = Sometimes; 1.81–2.60 = Rarely; 1.00–1.80 = Never.

Table 5 suggests that the respondents used generative AI sometimes depending on its utility. Using AI to solve challenging aspects of school activities, with a mean of 3.49, was the highest among the functionality indicators, which means Often. In contrast, the lowest mean (2.63) was recorded while reviewing documents in need of modification with AI. Thus, learners were more likely to ask for help when facing difficulties in academic activities rather than methodically using AI to analyze previously produced outputs. The rest of the signs were evaluated as Sometimes, meaning that AI aid was used selectively based on the nature of the academic need.

Availability was interpreted as Often with an aggregate mean of 3.54 from the respondents. The greatest mean was found for access to AI via available devices such as smartphones, tablets or PCs (4.36). This shows that students consistently made use of accessible devices when interacting with generative AI. Using AI for other jobs and studying topics beyond current teaching were also regarded as Often. But the two items: “Accessing AI whenever I needed help” and “Using AI outside class hours” were both evaluated as Sometimes. These data indicate that students' AI use was strongly characterized by access via devices, with the frequency of utilizing these applications being contingent on certain learning contexts.

Complexity related practices had an overall mean score of 3.54 which is interpreted as Often. The greatest mean was reported for amending prompts when the AI-generated responses did not suit the needs of the respondents (4.29), which was interpreted as Always. This was followed by asking follow-up questions, demanding easier explanations, and breaking down difficult tasks into smaller parts, all of which were perceived as Often. Seeking instructions or demonstrations when unfamiliar with AI features had the lowest mean whic is 2.83. These results imply that students often changed their interactions with AI to improve the utility of the generated responses, but they were less likely to seek more instructional advice on unfamiliar parts of the application.

Environmental Awareness of the Water Footprint of Artificial Intelligence

Environmental awareness was examined through comprehensive understanding of environmental problems, active concern for the environment, sense of environmental responsibility, and motivation to protect the environment. The findings are presented in Table 6.

Table 6

Environmental Awareness of Senior High School Students Regarding the Water Footprint of Artificial Intelligence

Indicators	Weighted Mean	Interpretation
Comprehensive Understanding of Environmental Problems		
Understanding AI's dependence on physical infrastructure	2.82	Agree
Understanding water use for data center cooling	3.33	Strongly Agree
Recognizing water as part of AI's resource demands	3.28	Strongly Agree
Understanding water demand in water-limited areas	3.17	Agree
Explaining the connection between AI use and water demand	3.12	Agree
Overall Mean	**3.14**	**Agree**
Active Concern for the Environment		
Concern about water needed by AI data centers	3.33	Strongly Agree
Considering AI's possible effects on water resources	3.42	Strongly Agree
Interest in learning how AI data centers use water	3.42	Strongly Agree
Concern for communities with limited water supplies	3.42	Strongly Agree
Recognizing the importance of AI's water footprint	3.41	Strongly Agree
Overall Mean	**3.40**	**Strongly Agree**
Sense of Environmental Responsibility		
Responsibility to learn about AI resource requirements	3.41	Strongly Agree
Responsible decisions about when and why to use AI	3.28	Strongly Agree
Seeking reliable information before sharing claims	3.47	Strongly Agree
Responsibility of AI providers for water management	3.41	Strongly Agree

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Recognizing shared responsibility for water protection	3.46	Strongly Agree
Overall Mean	**3.41**	**Strongly Agree**
Motivation to Protect the Environment		
Willingness to learn more about AI's water footprint	3.54	Strongly Agree
Willingness to discuss AI's resource use with classmates	3.21	Agree
Considering whether AI is necessary before use	3.47	Strongly Agree
Willingness to participate in school activities	3.06	Agree
Motivation to support water protection efforts	3.53	Strongly Agree
Overall Mean	**3.36**	**Strongly Agree**

Note. Interpretations follow the four-point rating scale: 3.26–4.00 = Strongly Agree; 2.51–3.25 = Agree; 1.76–2.50 = Disagree; 1.00–1.75 = Strongly Disagree.

Table 6 demonstrates that complete grasp of environmental problems obtained an overall mean of 3.14 read as Agree. The statement with the highest rating was respondents' comprehension that water can be used to cool data center equipment that supports generative AI (3.33), followed by their recognition that such water consumption is part of AI's environmental resource demands (3.28). However, lower ratings were achieved for understanding AI's dependence on physical infrastructure (2.82), explaining the relationship between AI use and supporting water requirements (3.12), and recognizing the implications of increasing water demand in resource-limited places (3.17). These results indicate that respondents broadly understood the relationship between AI and water use, but were less confident in articulating the broader environmental implications.

Active care for the environment garnered an overall mean of 3.40 which was read as Strongly Agree. Interest in how AI-related data centers acquire and use water, worry for towns with limited water supply, and assessment of AI's potential impacts on water resources each received a mean of 3.42. High ranking was also given to the recognition that AI's water footprint deserved consideration along with its benefits (3.41). These results suggest that respondents had great concern about the potential environmental impacts of advanced artificial intelligence (AI) technology, especially in terms of water supplies and communities with water limits.

The overall mean for environmental responsibility is 3.41 read as Strongly Agree. The highest scored statement was related to checking the credibility of information before sharing claims about the water footprint of AI (3.47), followed closely by the awareness of the joint responsibilities of AI providers, governments, and users in water resource protection (3.46). Meaning, respondents also agreed overwhelmingly that firms offering AI services should handle their water consumption properly. Although contemplating when and why to deploy AI earned the lowest mean within this dimension (3.28), it was still within the Strongly Agree category. These results imply that students perceived environmental conservation as a shared responsibility that includes informed individual decisions and institutional accountability.

The mean of the motivation to safeguard the environment was 3.36, which was also interpreted as Strongly Agree. The highest mean was received by willingness to learn more about AI's water footprint (3.54), closely followed by enthusiasm to support water conservation measures (3.53). Respondents also strongly agreed that they would be prepared to consider if AI was necessary before adopting it (3.47). But the evaluations were comparably lower for willingness to discuss AI related resource consumption with classmates (3.21) and to take part in school activities connected to the environmental needs of AI (3.06). This trend indicates that students showed a high personal motivation to be better informed and environmentally responsible, whereas their readiness to engage in collaborative efforts for the environment was somewhat less prominent.

Relationship Between Respondents' Profile and Extent of Artificial Intelligence Usage

Table 7 presents the correlation coefficients and significance values for the relationships between the respondents' profile variables and the three dimensions of AI usage.

Table 7

Correlation Between Respondents' Profiles and Extent of Artificial Intelligence Usage

Profile	Functionality	Availability	Complexity
Age	.029 (.733)	.039 (.646)	.195* (.019)
Sex	.013 (.877)	.116 (.166)	.176* (.035)
Frequency of AI use	.154 (.065)	.191* (.022)	.155 (.064)
AI tools used	−.287** (p<.001)	−.087 (.298)	−.163 (.050)
Purpose of AI use	.312** (p<.001)	.179* (.031)	.291** (p<.001)

Table 7 demonstrates that age had a statistically significant (although weak) positive association with complexity-related AI practices (r = .195, p = .019). Age relationships with functionality and availability, however, were not significant. This implies that age was linked to variations in the manner in which respondents interacted with increasingly complicated AI interactions. Sex was also significantly related to practices concerning complexity (r = .176, p = .035). However, this relationship cannot be understood in a meaningful way without taking into account the coding of sex. No significant connections were found between age and sex and the other characteristics of AI utilization.

Availability was weakly positively associated with frequency of generative AI use and statistically significant (r = .191, p = .022). Thus, those who reported more regular AI use were also more likely to achieve higher availability-related

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usage scores. But frequency was not significantly related to functionality or complexity related behaviors. Thus, regular usage of generative AI was connected to the use of generative AI due to reasons associated with its accessibility, but did not show statistically significant associations with all dimensions of students' use of the technology.

The analysis provided also showed a significant negative relationship between the variable reflecting AI tools utilized and functionality (r = −.287, p <.001). Furthermore, the purpose-of-use variable was significantly and positively correlated with functionality (r = .312, p <.001), availability (r =.179, p =.031), and complexity (r =.291, p <.001). However, because the questionnaire allowed respondents to select numerous AI tools and goals, these coefficients demand explanation on how the replies were translated into numerical variables. The results should be interpreted as preliminary statistical relationships until the coding has been confirmed, and not as evidence that specific applications or goals were directly associated with higher or lower levels of AI use.

Relationship Between Respondents' Profile and Environmental Awareness

Table 8 presents the relationships between respondents' profiles and environmental awareness across the four dimensions of comprehensive understanding, active concern, environmental responsibility, and motivation to protect the environment.

Table 8

Correlation Between Respondents' Profiles and Environmental Awareness of AI's Water Footprint

Profile	Understanding	Active Concern	Responsibility	Motivation
Age	.376** (p<.001)	.318** (p<.001)	.353** (p<.001)	.151 (.071)
Sex	−.100 (.235)	.005 (.948)	.061 (.465)	.109 (.192)
Frequency of AI use	.125 (.135)	.132 (.114)	.074 (.377)	.097 (.250)
AI tools used	−.155 (.064)	−.073 (.387)	−.088 (.292)	−.043 (.611)
Purpose of AI use	.174* (.037)	.054 (.523)	.181* (.030)	.225** (.007)

As shown in Table 8, age was statistically significantly and positively associated with overall comprehension (r = .376, p < .001), active environmental concern (r = .318, p < .001), and environmental responsibility (r = .353, p < .001). The results showed that the older respondents were more likely to express a higher level of comprehension of AI-related environmental problems, greater concern about prospective effects for water resources, and a better sense of environmental responsibility. However, age and motivation to protect the environment were not significant (r =.151, p =.071).

Conversely, no statistically significant link was found between sex and any facet of environmental awareness. Similarly, the frequency of AI use revealed no statistically significant association with full understanding, active concern, environmental responsibility or motivation. These data reveal that the students who used more AI did not necessarily report higher knowledge of its water footprint. This distinction is important as the respondents were all generative AI users, but the frequency of their contact with these technologies was not strongly associated to their environmental awareness ratings.

The AI techniques utilized also did not demonstrate statistically significant coefficients in the four domains of awareness. Meanwhile, purpose-of-use variable had significant positive relationships with comprehensive awareness (r =.174, p =.037), environmental responsibility (r = .181, p =.030), and motivation to safeguard the environment (r =.225, p = .007). No significant relationship was seen with active worry (r = .054, p = .523).

Relationship Between Extent of AI Usage and Environmental Awareness

The relationships between the dimensions of AI usage and environmental awareness are presented in Table 9.

Table 9

Correlation Between Extent of Artificial Intelligence Usage and Environmental Awareness of AI's Water Footprint

AI Usage Dimension	Understanding	Active Concern	Responsibility	Motivation
Functionality	.145 (.083)	.275** (.001)	.228** (.006)	.252** (.002)
Availability	.403** (p<.001)	.373** (p<.001)	.472** (p<.001)	.352** (p<.001)
Complexity	.231** (.005)	.375** (p<.001)	.466** (p<.001)	.294** (p<.001)

Table 9 demonstrates that functioning was shown to have statistically significant positive correlations with active environmental concern (r =.275, p =.001), environmental responsibility (r =.228, p =.006), and motivation to protect the environment (r =.252, p =.002). However, its association with complete understanding was not statistically significant (r =.145, p =.083). These results show that students who reported a higher frequency of functional usage of generative AI also tended to display higher environmental concern, responsibility, and drive. However, the similar relationship was not seen for their reported grasp of the environmental issues related with the water footprint of AI.

Availability had statistically substantial positive correlations with all four characteristics of awareness. The strongest link was with environmental responsibility (r = .472, p <.001), followed by comprehensive understanding (r =.403, p < .001), active environmental concern (r = .373, p <.001) and motivation to safeguard the environment (r =.352, p <.001). These results suggest that respondents with higher AI use scores about availability also tended to have more favorable environmental awareness. Among the characteristics of AI use,

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the strongest correlation with comprehension in its whole was the availability of AI use.

AI practices concerning complexity also showed statistically significant positive correlations with all four dimensions of awareness. The strongest link was with environmental responsibility (r = .466, p <.001) followed by active environmental concern (r =.375, p < .001), motivation to protect the environment (r =.294, p <.001) and comprehensive understanding (r =.231, p =.005). These data suggest that students who reported more frequent use of strategies such as modifying prompts, demanding clearer explanations, and asking follow-up questions also tended to exhibit greater environmental awareness and responsibility.

DISCUSSION

Based on the presented results of this study, using generative AI was included in the academic experiences of the senior high school students of General Luna National High School. All respondents said they have utilized generative AI and the most picked application was ChatGPT. The most generally mentioned reasons were learning lessons, meeting academic obligations and preparing for examinations. These results are consistent with Boncillo (2025) reiterated that AI has contribution in personalized education and in the completion of learning-related activities. In particular, in the case of the Philippines, Co (2025) found that while the students generally had a positive impression of AI, its application was inconsistent among educational institutions. The present findings extend this discussion to the context of the local senior high school, revealing that learners used generative AI for different academic reasons. However, the ubiquity of AI use should not be automatically seen as proof of ethical, environmentally aware technology use. Instead, the results suggest the need to investigate what learners know about the devices they often use.

The degree of AI use also shows that students interacted with generative AI in varied ways based on the goal and nature of their academic activity. The total evaluations for availability and complexity-related practices were higher than for functionality, suggesting that students often used AI on available devices and changed their interactions to receive more meaningful feedback. This tendency is relevant for the applications cited by Wang et al. (2024), particularly the adaptive and interactive characteristics of AI-supported learning environments. In contrast, Gocen and Aydemir (2020) emphasized that AI should be considered in terms of its potential effects on the students' independence and the changing responsibilities of teachers. The National Education Association (2024) also pointed out the need to retain human judgment in the loop and develop AI literacy in learners. In this sense, regular interaction with AI by the respondents must also offer opportunity to critically examine the information generated and grasp the wider ramifications of adopting these technologies.

Although the use of generative AI was high among respondents, the lowest score among the four awareness categories was the overall grade for a thorough understanding of the environmental effects of generative AI. Students generally acknowledged that they understood the water requirements of AI infrastructure, but expressed significantly lesser capacity to articulate the relationship between individual AI use and its supporting physical systems. This conclusion implies a difference between identifying an abstract environmental problem and holding a greater awareness of how that problem is produced. College students also reported little understanding of some environmental concerns of generative AI, such as its freshwater and material needs (Dungo et al., 2025). The present study did not show the same level of inadequacy, but both studies underscore the significance of studying environmental awareness beyond students' acquaintance with AI applications. Furthermore, the current study utilized self-reported understanding instead of an objective knowledge test. Hence the findings show what the students themselves felt they understood, but do not in itself confirm the correctness or completeness of their knowledge of the water footprint of AI.

This difference between general awareness and comprehensive comprehension is especially relevant in relation to the environmental literature. These findings demonstrate that understanding AI's water impact is more than just knowing that data centers require water for cooling. Learners must also be aware of the connections between technology activities and the environmental systems which underpin them. The much lower results on describing the AI's dependence on physical infrastructure and understanding the implications in water-scarce areas suggest that these issues may be further emphasized in environmental learning activities.

A key conclusion of the study was the relatively high environmental concern and responsibility shown by the respondents. It is evident that the learners were concerned about the water footprint of AI, specifically its potential impact on the regions here in the Philippines with limited water supplies. Based on the results as well, they acknowledged the role of technology providers, governments and consumers in safeguarding water resources. These responses indicate that students were willing to take into account environmental impacts in addition to the benefits they received from AI. This view is similar with Asinas et al. (2026) who underlined that AI-related water management should have coordinated responsibilities amongst infrastructure operators, water authorities and policy makers. Likewise, United Nations News (2026) emphasized the need for transparency, efficiency of resources and prudent decision-making to tackle the environmental implications of AI. These current findings contribute to the learner-centered feature of these conversations by revealing that senior high school students reported their support for environmental responsibility even when they were not actively involved in the development or operation of AI infrastructure. Their comments suggest that at the user level, environmental responsibility can be interpreted in terms of making informed choices, sharing information appropriately, and being aware of larger institutional responsibilities.

Also, the respondents expressed a high motivation to learn more about the water footprint of AI and to support initiatives to safeguard water resources. However, readiness to join in school activities and to talk with peers about AI's environmental issues obtained relatively low ratings. Thus, personal environmental motivation was higher than the readiness for communal or school-based engagement. A useful comparison is provided by Gibbons et al. (2025) who explored awareness and behavioral intentions about digitally

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communicating AI's water footprint in a higher education context. Their findings demonstrated that providing information about previously unknown environmental costs made respondents feel the need to use AI capabilities. An awareness intervention was not included in the present study, but the relatively strong willingness of respondents to learn more points to a potential for educational activities that transmit AI-related environmental information in understandable and locally relevant ways. These may include classroom discussions, environmental information resources and campaigns of student awareness. Whether these tactics would raise awareness or actually change behavior would need to be evaluated subsequently.

The correlational results contribute another dimension of understanding to the relationship between students' qualities and environmental consciousness. Age was positively and significantly correlated with thorough understanding, active concern and responsibility for environment. The results indicated that the older respondents were more likely to express higher awareness in these areas. Age, however, was not substantially connected to motivation to protect the environment, suggesting that greater expressed understanding and concern did not necessarily translate into increased motivation. More crucially, generative AI use frequency was not substantially associated with any of the environmental awareness dimension. This research indicates that exposure to artificial intelligence (AI) tools per se did not differentiate pupils with higher self-reported environmental awareness from those with lower awareness scores. This is also consistent with the broader problem raised by Dungo et al. (2025), who noted that students' interaction with generative AI was not sufficient to assure adequate awareness of its environmental ramifications. Educational institutions should not presume that because learners use AI applications on a daily basis that they become aware of the resource requirements of AI.

The high correlations between numerous variables of AI use and environmental awareness offer a crucial additional perspective. Availability had positive link with all awareness dimensions, the strongest association being with environmental responsibility. A similar pattern was also seen for complexity-related activities, especially with environmental responsibility and active involvement. The results indicate that when learners used AI more frequently and had a greater diversity of using various AI platforms were also more likely to have a higher level of environmental consciousness. However, the lack of a significant correlation between functionality and comprehensive understanding implies that the employment of AI to perform academic activities was not always linked to a better reported grasp of its environmental consequences. This distinction underlines the need to differentiate between a technology's use and knowledge of its environmental implications. AI literacy involves not only developing operational skills, but also learners' ability to make informed and responsible decisions (National Education Association, 2024). The outcomes of the present study indicate that environmental factors could be included in wider AI literacy programs, encouraging learners to explore the educational uses and resource needs of generative technologies.

The findings also have consequences on environmental education in the secondary schools. While accessibility, instructional usefulness, and learning support are often used as criteria for assessing technological integration, the environmental resources required for sustaining digital technologies are less often discussed. These findings put emphasis on the primary responsibility of lowering water use resting with the organizations that operate and regulate AI infrastructure, with individual users contributing through informed and intentional use of technology. In the present study, students were willing to learn more about AI's water footprint and determine if AI was necessary before utilizing it. The findings underscore the importance of educational efforts that promote informed technology choices without placing the onus on students to solve the environmental load of conventional artificial intelligence systems.

CONCLUSIONS

Based on the presented results the following conclusions were formulated:

1. The respondents were predominantly 16-year-old female students who used generative AI several times a week. ChatGPT was the most commonly used application, primarily for understanding lessons, completing assignments, and preparing for examinations.
2. The respondents sometimes used AI in terms of functionality but often utilized it in terms of availability and complexity-related practices. They particularly relied on accessible devices and frequently modified their prompts to obtain more appropriate responses.
3. Respondents indicated positive self-reported environmental awareness of AI's water footprint. The levels of active concern, environmental responsibility, and motivation to safeguard the environment were higher than the overall comprehension of environmental problems.
4. Significant correlations between the selected profile variables and the amount of the AI usage were observed especially between age and sex with complexity associated practices, and frequency of the AI use with availability.
5. Age was significantly related to comprehensive understanding, active environmental concern, and environmental responsibility, whereas sex and frequency of AI use were not significantly related to any environmental awareness dimension.
6. The extent of AI usage was significantly and positively related to most dimensions of environmental awareness.

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REFERENCES

1. *Agence France-Presse. (2025, February 1). Generative AI's environmental impact in figures. ABS-CBN News. https://www.abs-cbn.com/news/technology/2025/2/1/generative-ai-s-environmental-impact-in-figures-1434*
2. *Asinas, E., Ahmad, S., Babbar-Sebens, M., Fu, G., Lee, J., Sela, L., & Yang, T. (2026). A thirsty future: AI's hidden water footprint. Journal of Water Resources Planning and Management, 152(11), Article 01826002. https://doi.org/10.1061/JWRMD5.WRENG-7706*
3. *Boncillo, J. J. (2025). AI in education: A systematic review of its applications, benefits, and ethical challenges. International Journal of Multidisciplinary Educational Research and Innovation, 3(2), 436–447.*
4. *Co, S. J. (2025). Artificial intelligence in Philippine education: A narrative review of applications, perceptions, and challenges. International Research Journal of Science, Technology, Education, and Management, 5(2), 25–38. https://doi.org/10.5281/zenodo.15902950*
5. *Demol-Jenae, J. (2026, May 15). AI's growing thirst. Philippine Daily Mirror.*
6. *Dungo, C. A. B., Beltran, Z. L. E., Declaro, B. C., Dela-Cruz, J. J. C., & Viray, R. U. (2025). Students' level of awareness on the environmental implications of generative AI. Journal of Education in Science, Environment and Health, 11(2), 93–107. https://doi.org/10.55549/jeseh.777*
7. *Environmental and Energy Study Institute. (2025, June 25). Data centers and water consumption. https://www.eesi.org/articles/view/data-centers-and-water-consumption*
8. *Gibbons, S., Watts, C., White, S., & Bach, L. (2025). Investigating awareness and behavioural intentions from AI water footprint digital posters in higher education settings. Sustainable Futures, 10, Article 101533. https://doi.org/10.1016/j.sftr.2025.101533*
9. *Gocen, A., & Aydemir, F. (2020). Artificial intelligence in education and schools. Research on Education and Media, 12(1), 13–21. https://doi.org/10.2478/rem-2020-0003*
10. *National Education Association. (2024). Report of the NEA task force on artificial intelligence in education.*
11. *Rodrigo, M. M. T., & Talandron-Felipe, M. M. P. (2024). Using artificial intelligence to support basic education teachers in under-resourced contexts (Research Paper Series No. 007). Second Congressional Commission on Education.*
12. *United Nations News. (2026, June 4). AI's environmental costs threaten water, land and climate. https://news.un.org/en/story/2026/06/1167658*
13. *Wang, S., Wang, F., Zhu, Z., Wang, J., Tran, T., & Du, Z. (2024). Artificial intelligence in education: A systematic literature review. Expert Systems with Applications, 252, Article 124167. https://doi.org/10.1016/j.eswa.2024.124167*
14. *Xiao, T., Nerini, F. F., Matthews, H. D., Tavoni, M., & You, F. (2025). Environmental impact and net-zero pathways for sustainable artificial intelligence servers in the USA. Nature Sustainability, 8, 1541–1553. https://doi.org/10.1038/s41893-025-01681-y*
15. *Zewe, A. (2025, January 17). Explained: Generative AI's environmental impact. MIT News. https://news.mit.edu/2025/explained-generative-ai-environmental-impact-0117*